INTERSECTION CASUALTY ACCIDENTS: TRENDS, CHARACTERISTICS, PERSONS INVOLVED, AND CONSEQUENCES. BRITISH COLUMBIA, 1985.

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SUMMARY

To summarize, 42% to 46% of all casualty accidents in B.C. occurred where one road crossed another, with the highest number and lowest proportion occurring during the summer months. They happened most frequently in business and shopping areas, especially during the evening "rush hours". They tended to occur in daylight or in good artificial lighting and primarily in good weather, although about a third occured in wet conditions.

Turning to the traffic control devices at the accident scene, a third of the casualty intersection accidents occurred where there were no traffic signs or signals, a third where there were stop signs, and a third were there were stop lights. Of the latter, 45% occurred on a red light, 45% on a green light, and 10% on an amber light. It is noteworthy that, contrary perhaps to the popular impression, only 3% of all intersection casualty accidents occurred on an amber light and 14% on a red light, leaving 83% not associated with automatic traffic signal violations.

Over 80% of these intersection casualty accidents were multiple-vehicle accidents, with only 9% involving pedestrians and 8% involving bicycles. In 43% of the instances one vehicle struck the other at a 90° angle, while 28% involved rear-end collisions. The causes included Failure to Yield the Right of Way (29%), Driving Without Due Care (25%), Unsafe Speed (10%) and Alcohol (9%).

Comparing intersection casualty accidents to non-intersection casualty accidents, the drivers in intersection accidents were older (average age 35 years), carried fewer passengers (65% carried no passengers), and reported a higher frequency of restraint device use. While 67% of the drivers in these accidents were male, half of all male drivers and over half of all female drivers who had casualty traffic accidents in 1985 had them at intersections. The male drivers in these accidents reported lower restraint device use in their vehicles and carried older passengers than did the female drivers. Overall, intersection casualty accidents produced a lower proportion of fatalities and less severe injuries than did non-intersection casualty accidents.

In terms of countermeasures, high-visibility police enforcement campaigns at controlled intersections has shown promise as a way to reduce, at least for the duration of the campaign, driving behaviours that could lead to traffic accidents (Mercer, 1986). However, as two-thirds of intersection accidents occurred at intersections with no traffic signs or signals, or at intersections with only stop signs, and as these sorts of intersections are far too numerous to be included in targetted intersection enforcement campaigns, it follows that driver education dealing

with right-of-way and driver courtesy may help to reduce these accidents. Further, as a high proportion of intersection casualty accidents involve rear-end collisions, driver education on following distances might be considered.

The target groups for such education materials ought to focus on adult drivers carrying no passengers who are on the road during "rush hours", and on adult female drivers carrying young passengers. Themes that could prove useful might include the notion of not carrying the day's work stress over into the task of driving home, of responsibility to those waiting at home, and, especially for the female driver, responsibility for her young passengers.

Finally, unlike the speed-and-alcohol traffic accidents that tend not to occur at intersections, intersection casualty accidents appear to be less of a product of "lifestyle" and more of a product of inattention, discourtesy, and perhaps ignorance of the basic rules of the road. Consequently, with a combination of public education and police enforcement programs, there is reason to hope that these accidents could be successfully reduced.

Intersection Casualty Accidents: Trends, Characteristics, Persons Involved, and Consequences. British Columbia, 1985.

Traffic accidents where one road crosses another make up almost half of all traffic accidents that produce injury or death in British Columbia. In urban areas intersection casualty accidents comprise over half of all casualty accidents (Mercer, 1984). In order to devise countermeasures aimed at reducing these accidents, it is necessary to know the characteristics of the accidents and of the drivers involved. Consequently, it is the purpose of this paper to examine intersection casualty accidents in British Columbia in terms of their trends and patterns, time and conditions, vehicles involved, pre-collision and collision events, post-collision events and contributing factors, drivers, passengers, victims, and charges laid in the hope of providing information that could be applied to reducing these accidents.

METHOD

In order to examine trends in intersection casualty accidents (i.e. an accident where one or more persons were injured or killed), police traffic Accident Reports (MV104) were examined from 1977 to the first half of 1986, while a detailed analysis of these accidents was drawn from the 1985 MV104 casualty accident reports. As the raw data from these police reports are managed by the Motor Vehicle Department of the Ministry of Transportation and Highways, and as that Department

is constantly improving their data base, any statistics produced by that Department that contradict those reported herein ought to be considered as the more accurate.

For the purpose of this paper, "intersection" is defined as the place where two roads cross each other, as opposed to a "T" junction.

RESULTS AND CONCLUSIONS

TRENDS AND PATTERNS:

As can be see from Table 1 and Figures 1 and 2, the proportion of casualty traffic accidents occurring at intersections has remained relatively constant over the period between 1977 and the first six months of 1986, although there appears to be a possible increasing proportional trend from the 42% level that held between 1977-1982 to the 46% level in early 1986. Seasonally, while the absolute number of intersection casualty accidents increases in the summer, the proportion decreases. Further, the proportion of these accidents appears to increase in the spring and fall, and to decrease sharply in the December-January period.

CASUALTY ACCIDENT CHARACTERISTICS:

Time and Conditions:

As can be seen from Tables 2 and 3, intersection casualty accidents tended to occur in high proportions in municipal areas, in business/shopping (41%), and residential (35%) areas. Table 4 shows that, like non-intersection casualty accidents, intersection casualty accidents tended to peak towards the end of the week. However, the weekend increase for intersection casualty

Table 1
Casualty Accident Frequencies:
Year by Percentage at Intersections.
British Columbia.

YEAR	TOTAL # OF CASUALTY ACCIDENTS	% AT INTERSECTION
1977	22,442	41.5%
1978	23,052	42.3%
1979	26,274	42.1%
1980	28,698	42.3%
1981	30,907	42.4%
1982	23,813	41.9%
1983	22,669	43.0%
1984	22,974	44.1%
1985	24,635	45.0%
1986 (first 6 months)	12,753	45.7%

Table 2
Percentage of Intersection Casualty Accidents by Police Subdivision
British Columbia, 1985.

LOCATION	Total # of Casualty Accidents	% Intersection Accident
Courtenay Municipal	441	50%
Courtenay Rural	727	23%
Kamloops Municipal	565	52%
Kamloops Rural	794	11%
Kelowna Municipal	986	54%
Kelowna Rural	886	21%
Nelson Municipal	158	52%
Nelson Rural	772	18%
Prince George Municipal	621	54%
Prince George Rural	804	15%
Prince Rupert Municipal	174	50%
Prince Rupert Rural	405	14%
Victoria Municipal	658	51%
Victoria Rural	715	32%
R.C.M.P. District 1		
Municipal	6,875	54%
Rural	743	23%
R.C.M.P. Freeway Patrol	569	8%
Nelson Area Independents	27	63%
Vancouver Area Independents	6,276	56%
Victoria Area Independents	1,416	55%
Other Police	10	20%
British Columbia Total	24,622	45%

FIGURE 1
PERCENT OF CASUALTY ACCIDENTS OCCURRING AT INTERSECTIONS.
BRITISH COLUMBIA, JAN. 1977-JUNE 1986.

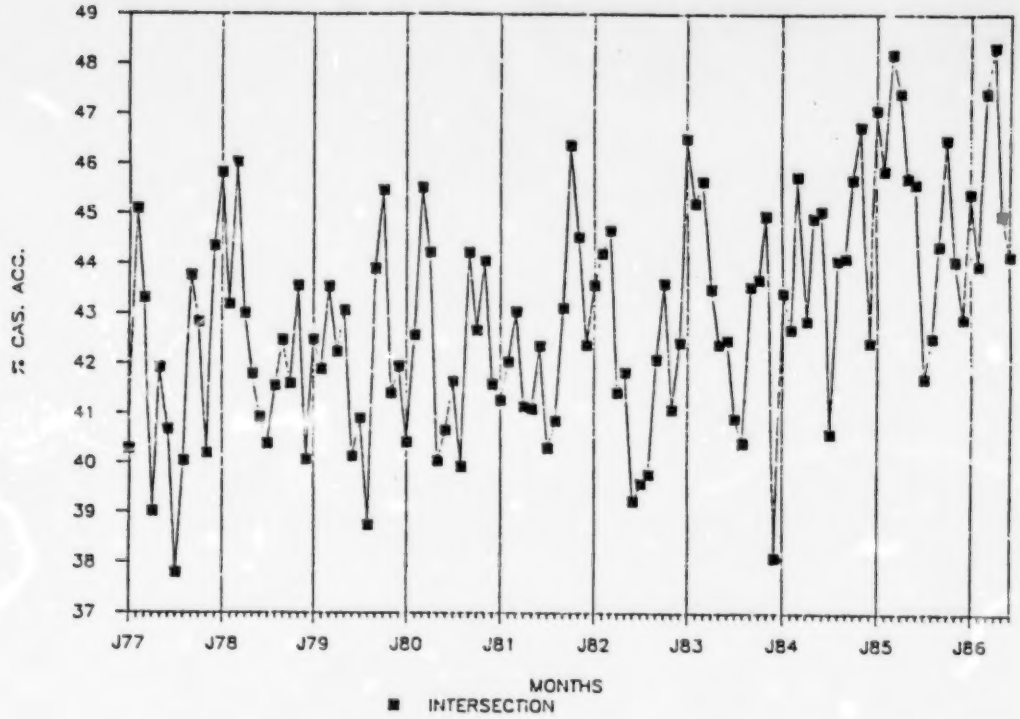


FIGURE 2
NUMBER OF INTERSECTION AND TOTAL NUMBER OF CASUALTY ACCIDENTS.
BRITISH COLUMBIA, JAN. 1977-JUNE 1986.

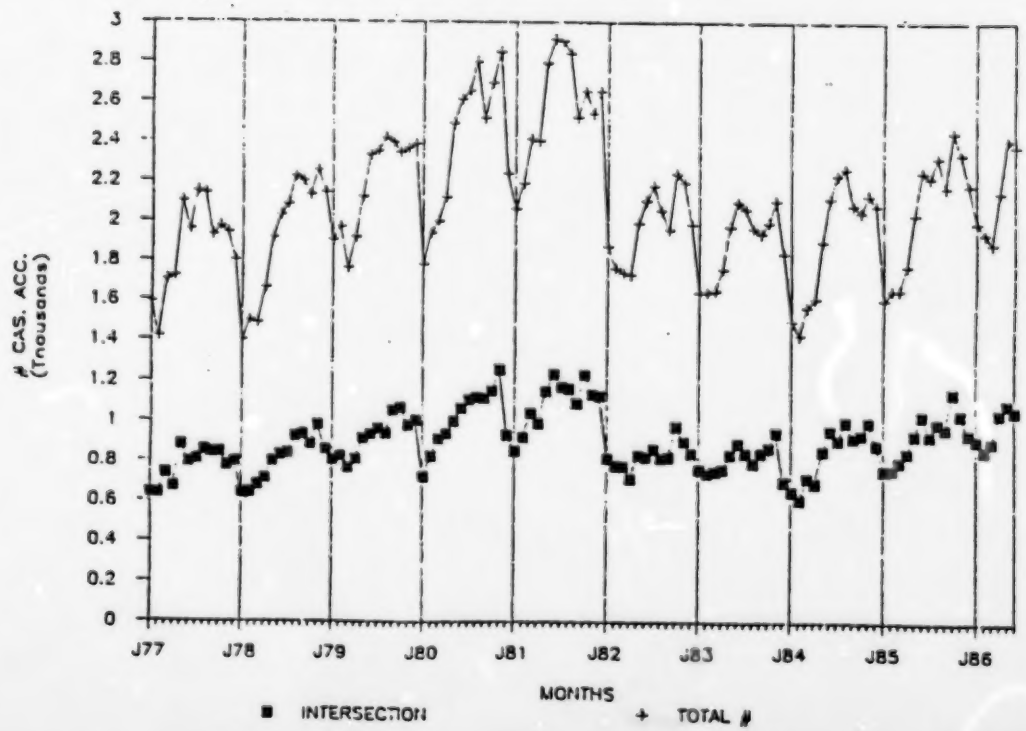


Table 3
Land Use at Casualty Accidents:
Intersection vs. Non-intersection,
British Columbia 1985.

Inter-section Accid.	LAND USE						
	School/ Playgrnd	Family Res.	Apart-ment	Business/ Shopping	Indus-trial	Agricul-tural	Recreation Camp/Park
No	2%	25%	4%	22%	7%	37%	4%
Yes	3%	35%	6%	41%	5%	9%	1%
B.C. Total	3%	29%	5%	30%	6%	25%	2%

Table 4
Day of Week of Casualty Accidents:
Intersection vs. Non-intersection,
British Columbia, 1985.

Inter-section Accident	DAY OF WEEK						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
No	12%	14%	12%	14%	17%	18%	14%
Yes	13%	14%	14%	16%	18%	15%	11%
B.C. Total	12%	14%	13%	15%	18%	16%	12%

Table 5
Time of day of Casualty Accidents:
Intersection vs. Non-intersection,
British Columbia, 1985.

Inter-section Accident	TIME OF DAY (two hour intervals)											
	Midnight 2:00 AM	2:00 AM 4:00 AM	4:00 AM 6:00 AM	6:00 AM 8:00 AM	8:00 AM 10:00 AM	10:00 AM NOON	NOON 2:00PM	2:00 PM 4:00 PM	4:00 PM 6:00 PM	6:00 PM 8:00 PM	8:00 PM 10:00 PM	10:00 PM Midnight
No	6%	5%	3%	6%	8%	8%	10%	13%	14%	10%	8%	7%
Yes	4%	3%	1%	5%	9%	10%	13%	16%	17%	11%	8%	5%
B.C. Total	5%	4%	2%	5%	8%	9%	11%	15%	15%	10%	8%	7%

accidents was less than for non-intersection accidents, while the proportion of intersection accidents occurring on weekdays was higher than the proportion of non-intersection accidents occurring on weekdays. Similarly, Table 5 shows that, like non-intersection casualty accidents, intersection casualty accidents occurred most frequently between 10:00 a.m. and 8:00 p.m., and in particular during the evening "rush hours".

Turning to the accident environment, Table 6 shows that intersection casualty accidents were more likely than non-intersection casualty accidents to have occurred in daylight (70% vs. 60%) or in artificial illumination (23% vs. 18%). Tables 7 and 8 show that, while overall most intersection and non-intersection accidents occurred in relatively good weather (78% vs. 80%) and on dry roads (62% vs. 60%), intersection casualty accidents tended to occur more in wet (30% vs. 23%) conditions. Finally, Table 9 shows that intersection casualty accidents occurred where there was a stop sign (32%), where there were no traffic control devices (32%), and where there was a red (14%) or equally where there was a green (14%) signal, while the vast majority (93%) of non-intersection casualty accidents occurred where there were no traffic control devices.

Vehicles:

Non-intersection casualty accidents were more than twice as likely to involve only one vehicle (48.2%) than were intersection casualty accidents (16.1%). The average number of vehicles involved in an intersection casualty accident was 1.9, while for a non-intersection casualty accident it was 1.6. On the other

Table 6
Light Conditions During Casualty Accidents:
Intersection vs. Non-Intersection,
British Columbia, 1985.

Intersection Accident	LIGHT CONDITION					
	Daylight	Dawn	Dusk	Night/Full Illumination	Night/Some Illumination	Night/No Illumination
No	60%	2%	4%	5%	13%	16%
Yes	70%	1%	4%	8%	15%	3%
B.C. Total	64%	2%	4%	6%	14%	10%

Table 7
Weather Conditions During Casualty Accidents:
Intersection vs. Non-Intersection,
British Columbia, 1985.

Intersection Accident	WEATHER CONDITION				
	Clear	Cloudy	Raining	Snow/Sleet	Other
No	55%	25%	12%	5%	3%
Yes	54%	24%	16%	3%	3%
B.C. Total	54%	25%	14%	4%	3%

Table 8
Road Surface Characteristics at Casualty Accidents:
Intersection vs. Non-Intersection,
British Columbia, 1985.

Intersection Accident	ROAD SURFACE CONDITION				
	Dry	Wet	Snow	Slush	Ice
No	60%	23%	5%	2%	10%
Yes	62%	30%	3%	1%	4%
B.C. Total	61%	26%	4%	2%	7%

Table 9
Traffic Control Device at Casualty Accidents:
Intersection vs. Non-Intersection,
British Columbia, 1985.

Intersection Accident	TYPE OF TRAFFIC CONTROL						
	None	Stop Sign	Yield Sign	Signal Red	Signal Amber	Signal Green	Other
No	93%	1%	3%	1%	0%	1%	2%
Yes	32%	32%	3%	14%	3%	14%	2%
B.C. Total	66%	15%	3%	7%	2%	7%	2%

hand, the proportions of casualty accidents between a motor vehicle and a motorcycle, pedestrian, or cyclist were very similar between intersection and non-intersection accidents, as can be seen from Table 10. It should be noted that the "other motor vehicle" category in Table 10 includes multiple-vehicle accidents excluding car-motorcycle accidents. The proportion of casualty accidents involving any motorcycles for intersection locations was 7.2% and for non-intersection locations was 8.0%. Finally, commercial vehicle casualty accidents occurred less frequently at intersections (4% vs. 6%), as did casualty accidents involving out-of-province vehicles (6% vs. 8%).

Pre-collision and Collision Events:

Table 11 shows that prior to the collision 58% of the vehicles in non-intersection casualty accidents and 59% of the vehicles in intersection casualty accidents were going straight ahead. The largest difference in pre-collision activity occurred in the "left turn" category, which contained 5% of the vehicles in non-intersection and 18% of the vehicles in intersection casualty accidents. Table 12 shows that the point of impact in intersection casualty accidents was predominantly at a 90° angle (43%) followed by "rear end" (28%) while for non-intersection casualty accidents the impact occurred at the rear end (28%) followed by running off the road to the right (26%) and to the left (18%). It should be noted that running off to the left would generally involve crossing one or more lanes of traffic.

Table 10
Casualty Accident Collision Types:
Intersection vs. Non-intersection,
British Columbia, 1985.

Intersection Accid.	TYPE OF COLLISION												
			SINGLE MOTOR VEHICLE COLLISIONS										
	Other Ven.	Motor-cycle	Pedes-trian	Bike	Animal	Light Pole	Util Pole	Guard Rail	Tree	Curb	Ditch	Over turned	Other
No	50%	3%	8%	6%	2%	2%	3%	1%	2%	2%	12%	3%	6%
Yes	73%	5%	9%	8%	0%	1%	1%	0%	0%	1%	2%	1%	0%
B.C. Total	61%	4%	8%	7%	1%	1%	2%	1%	1%	1%	7%	2%	4%

Table 11
Pre-collision Action of Vehicles in Casualty Accidents:
Intersection vs. Non-intersection,
British Columbia, 1985.

Intersection Accident	PRE-COLLISION ACTION											
	Going straight	Right turn	Left turn	Slowing/ Stopping	Stopped in Traffic	Avoid object	Change lanes	Over-taking	Backing	Skidding	Swerving	Other
No N=20,103	58%	3%	5%	4%	8%	1%	2%	2%	2%	6%	2%	7%
Yes N=20,139	59%	5%	18%	4%	9%	0%	1%	1%	0%	2%	0%	1%
B.C. Total N=40,232	58%	4%	11%	4%	8%	0%	1%	1%	1%	4%	1%	7%

Table 12
Vehicle Manoeuver at Point of Impact in Casualty Accidents:
Intersection vs. Non-intersection,
British Columbia, 1985.

Intersection Accident	VEHICLE MANOEUVER									
	Rear End	Head On	Side Swipe	Intersecting at 90°	Over-taking	Right turn	Left turn	Run off road to right	Run off road to left	Other
No	28%	7%	5%	5%	3%	1%	3%	26%	18%	4%
Yes	28%	2%	1%	43%	2%	1%	15%	4%	2%	2%
B.C. Total	28%	5%	3%	23%	3%	1%	9%	16%	11%	1%

Post-collision and Contributing Factors:

Table 13 shows that non-intersection casualty traffic accidents tend to produce more severe vehicle damage than did intersection casualty accidents, and this is reflected in the 2.4% fatality rate for non-intersection casualty accidents as opposed to the 0.9% fatality rate for intersection casualty accidents. Both intersection and non-intersection casualty accidents had about the same proportion of hit-and-run occurences (4.5% vs. 4.2%).

Table 14 compares these two types of casualty accidents in terms of commonly cited contributing factors determined by the investigating police officers. (As there can be as many as three factors per vehicle, these proportions can add to more than 100%). The four most frequently cited contributing factors for intersection casualty accidents were failure to yield right of way (29%), driving without due care (25%), unsafe speed (10%), and alcohol (9%), while for non-intersection casualty accidents they were driving without due care (30%), unsafe speed (19%), alcohol (17%) and weather (14%).

PERSONS INVOLVED:

Table 15 shows that both intersection and non-intersection casualty accidents involved similar proportions of drivers (64% vs. 62%) and similar proportions of pedestrians (3%), while intersection accidents involved a somewhat smaller proportion of passengers (30% vs. 33%) and a larger proportion of cyclists (3% vs. 2%). It should be noted that these figures represent those involved who were injured as well as those who escaped injury.

Table 13
Damage Severity to Vehicle in Casualty Accidents:
Intersection vs. Non-intersection.
British Columbia, 1985.

Intersection Accident	DAMAGE SEVERITY				
	No Damage	Light Damage	Moderate Damage	Severe Damage	Demolished
No N=18,392	9%	27%	27%	21%	16%
Yes N=17,957	9%	31%	32%	20%	8%
B.C. Total N=36,349	9%	29%	30%	21%	12%

Table 14
Contributing Factors to Casualty Accidents:
Intersection vs. Non-intersection.
British Columbia, 1985.

Intersection Accident	CONTRIBUTING FACTORS						
	% Driving w/o Due Care	% Alcohol Related	% Driving at Unsafe Speed	% Fail to Yield	% Due to Weather	% Following too Closely	% Vehicle Fault
No	30%	17%	19%	5%	14%	7%	5%
Yes	25%	9%	10%	29%	7%	7%	3%
B.C. Total	27%	13%	15%	16%	11%	7%	4%

Table 15
Persons Involved in Casualty Accidents:
Intersection vs. Non-intersection.
British Columbia, 1985.

Intersection Accident	PERSONS INVOLVED			
	Drivers	Passengers	Pedestrians	Cyclists
No N=32,583	62%	33%	3%	2%
Yes N=32,037	64%	30%	3%	3%
B.C. Total N=64,620	63%	32%	3%	2%

Drivers and Passengers:

From Table 16 it can be seen that intersection casualty accidents on an average involved older drivers (35 yrs. vs. 33 yrs.) with a lower proportion of male drivers (67% vs. 72%), while Figure 3 shows that, like non-intersection casualty accidents, intersection casualty accidents involved a high proportion of drivers in the 20-30 year old range for both genders (although to a lesser extent for female drivers).

Again from Table 16 it can be seen that, when compared to non-intersection casualty accidents, intersection casualty accidents involved fewer passengers per vehicle (0.51/vehicle vs. 0.58/vehicle), especially fewer male passengers (0.22 vs. 0.29 per vehicle). However, it should be noted that the majority of vehicles in both intersection (66%) and non-intersection casualty accidents (62%) carried no passengers. Finally, intersection casualty accidents had a higher reported restraint device use level (91% vs. 84%) than did non-intersection casualty accidents.

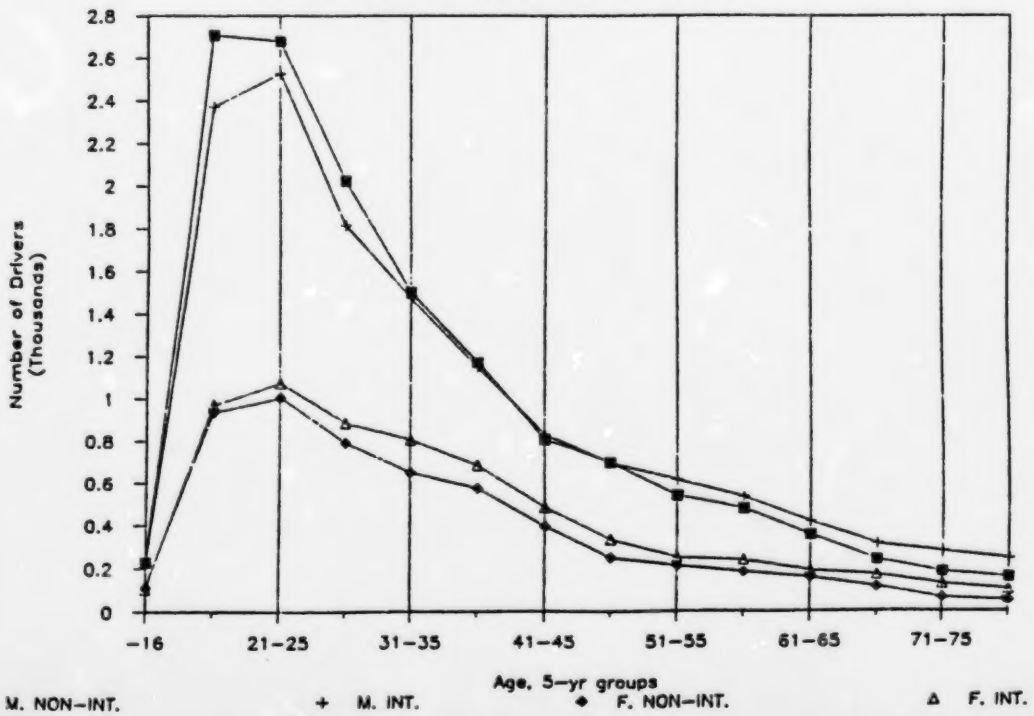
Although Table 16 shows that more male drivers were involved in intersection casualty accidents than were female drivers (67% vs. 33%), Table 17 shows that, of female drivers involved in casualty accidents, 53% were involved in intersection casualty accidents, while the figure for male drivers was 49%.

Comparing male and female drivers and their passengers involved in intersection casualty accidents, Table 17 shows that they are very similar in terms of average age, average number of passengers and percent of vehicles carrying passengers. On the

Table 16
Characteristics of Persons in Vehicles:
Intersection vs. Non-intersection Casualty Accidents.
British Columbia, 1985.

VARIABLE	INTERSECTION CASUALTY ACCIDENT	NON-INTERSECTION CASUALTY ACCIDENT	B.C. TOTAL
Average Driver's Age	34.7 yr.	32.9 yr.	33.8 yr.
% Male Drivers	66.6%	71.5%	69.5%
Average # Passengers in vehicle	0.51	0.58	0.54
Average # Male Passengers in vehicle	0.22	0.29	0.26
Average # Female Passengers in vehicle	0.28	0.28	0.28
Average Passenger's age	24.2 yr.	23.6 yr.	23.9 yr.
Average Male Passenger's age	21.0 yr.	21.6 yr.	21.3 yr.
Average Female Passenger's age	27.5 yr.	26.3 yr.	26.9 yr.
% Vehicles with Passengers	34.2%	37.8%	36.0%
% Vehicles with Male Passengers	17.2%	21.9%	19.5%
% Vehicles with Female Passengers	21.5%	21.6%	21.6%
% Occupant Seat Belt use	91.1%	84.4%	87.7%

FIGURE 3
DRIVER AGE AND GENDER BY NUMBER OF CASUALTY ACCIDENTS:
INTERSECTION VS. NON-INTERSECTION.
BRTIISH COLUMBIA, JAN. 1977-JUNE 1986.



other hand, male drivers tended to carry older passengers (26 yrs. vs. 21 yrs.), a higher proportion of male passengers, a lower proportion of female passengers, and showed a lower proportion of vehicle occupants using restraint devices.

PERSONS INJURED:

On an average in 1985, intersection casualty accidents injured 1.4 persons per accident and killed 0.01 for a total of 15,134 injuries and 113 deaths, while non-intersection casualty accidents injured an average of 1.4 persons per accident and killed an average of 0.03 per accident, for a total of 18,484 injuries and 367 deaths. Tables 18, 19, and 20 reflect the more serious nature of non-intersection casualty accidents in terms of injured persons' state of consciousness, injury types and injury locations. It should be noted that these assessments refer to the most serious injury to the person and were determined by the investigating officer, as opposed to by a physician.

CHARGES LAID:

Table 21 shows that a higher proportion of Motor Vehicle Act charges (e.g. speeding, failure to yield right of way) were laid in intersection than in non-intersection casualty traffic accidents (47% vs. 33%), but that a higher proportion of Criminal Code charges (e.g. Driving While Impaired, Dangerous Driving) were laid in non-intersection than in intersection casualty accidents (6.5% vs. 4.7%). However, in the majority of accidents no charges were laid by the police.

Table 17
Characteristics of Persons in Vehicles:
Intersection vs. Non-intersection Casualty Accidents
Comparison of Male and Female Drivers.
British Columbia, 1985.

VARIABLE	MALE DRIVERS			FEMALE DRIVERS		
	Intersection N=13,646 (49.3%)	Non-int'section N=14,023	B.C. Total	Intersection N=6,552 (53.4%)	Non-int'section N=5,609	B.C. Total
Average Driver's Age	34.5 yr.	32.6 yr.	33.6 yr	35.0 yr.	33.2 yr.	34.2 yr
% Male Drivers in other vehicle	67.6%	72.5%	69.7%	66.8%	66.1%	66.6%
Average # Passengers in vehicle	0.52	0.60	0.56	0.52	0.56	0.54
Average # Male Passengers in vehicle	0.23	0.32	0.27	0.21	0.25	0.22
Average # Female Passengers in vehicle	0.28	0.27	0.28	0.30	0.31	0.31
Average Passenger's Age	25.6 yr.	24.2 yr.	24.9 yr	21.4 yr.	22.1 yr.	21.8 yr
Average Male Passenger's age	21.6 yr	21.5 yr	21.6 yr	19.7 yr.	22.2 yr.	20.9 yr
Average Female Passenger's age	29.7 yr.	28.0 yr.	28.8 yr	23.4 yr.	22.7 yr.	23.1 yr
% Vehicles with Passengers	34.9%	39.3%	37.2%	34.6%	36.4%	35.4%
% Vehicles with Male Passengers	18.1%	23.5%	20.8%	16.2%	19.1%	17.6%
% Vehicles with Female Passengers	21.3%	21.4%	21.4%	23.0%	23.7%	23.3%
% Occupant Seat Belt use	89.6%	82.3%	85.8%	94.0%	89.3%	91.6%

Table 18
Injured Persons' State of Consciousness:
Intersection vs. Non-intersection Casualty Accidents.
British Columbia, 1985.

Intersection Accident	STATE OF CONSCIOUSNESS					
	Appears Normal	Agitated	Incoherent	Semi-conscious	Unconscious	Appears Dead
No N=18,269	73.8%	16.5%	2.2%	4.3%	1.2%	2.0%
Yes N=14,808	79.6%	14.8%	1.5%	2.5%	0.7%	0.7%
B.C. Total N=33,077	76.4%	15.8%	1.9%	3.5%	1.4%	1.4%

Table 19
Victims' Injury Type:
Intersection vs. Non-intersection Casualty Accidents.
British Columbia, 1985.

Inter-section Accident	INJURY TYPE							
	Abrasion	Bruise	Laceration	Bleeding	Fracture	Dislocation	Concussion	Whiplash
No N=16,144	12.4%	43.6%	15.7%	8.5%	9.7%	3.6%	2.6%	3.3%
Yes N=12,297	12.3%	57.6%	11.4%	6.6%	6.9%	3.6%	2.7%	4.3%
B.C. Total N=28,766	12.4%	46.5%	13.7%	7.6%	8.4%	3.6%	2.6%	3.7%

Table 20
Victims' Injury location:
Intersection vs. Non-intersection Casualty Accidents.
British Columbia, 1985.

Inter-section Accident	INJURY LOCATION					
	Head/ Neck	Chest/ Back	Arm/ Shoulder	Abdomen/ Hip	Lower Leg	All Body
No N=18,338	52.3%	13.9%	13.6%	5.9%	11.0%	3.2%
Yes N=14,831	53.3%	13.5%	11.6%	6.7%	12.8%	2.1%
B.C. Total N=33,169	52.8%	13.7%	12.7%	6.2%	11.8%	2.7%

Table 21
Motor Vehicle Act and Criminal Code Charges Laid:
Intersection vs. Non-intersection Casualty Accidents.
British Columbia, 1985.

Inter-section Accident	Motor Vehicle Act		Criminal Code	
	% Accidents where charges were laid	Average # Charges/ Accident	% Accidents where charges were laid	Average # Charges/ Accident
No	33.2%	0.38	6.5%	0.12
Yes	47.0%	0.54	4.7%	0.09
B.C. Total	39.3%	0.45	5.7%	0.10

CONCLUSIONS:

To summarize, 42% to 46% of all casualty accidents in B.C. occurred where one road crossed another, with the highest number and lowest proportion occurring during the summer months. They happened most frequently in business and shopping areas, especially during the evening "rush hours". They tended to occur in daylight or in good artificial lighting and primarily in good weather, although about a third occurred in wet conditions.

Turning to the traffic control devices at the accident scene, a third of the casualty intersection accidents occurred where there were no traffic signs or signals, a third where there were stop signs, and a third were there were stop lights. Of the latter, 45% occurred on a red light, 45% on a green light, and 10% on an amber light. It is noteworthy that, contrary perhaps to the popular impression, only 3% of all intersection casualty accidents occurred on an amber light and 14% on a red light, leaving 83% not associated with automatic traffic signal violations.

Over 80% of these intersection casualty accidents were multiple-vehicle accidents, with only 9% involving pedestrians and 8% involving bicycles. In 43% of the instances one vehicle struck the other at a 90° angle, while 28% involved rear-end collisions. The causes included Failure to Yield the Right of Way (29%), Driving Without Due Care (25%), Unsafe Speed (10%) and Alcohol (9%).

Comparing intersection casualty accidents to non-intersection casualty accidents, the drivers in intersection accidents were older (average age 35 years), carried fewer passengers (65% carried no passengers), and reported a higher frequency of restraint device use. While 67% of the drivers in these accidents were male, half of all male drivers and over half of all female drivers who had casualty traffic accidents in 1985 had them at intersections. The male drivers in these accidents reported lower restraint device use in their vehicles and carried older passengers than did the female drivers. Overall, intersection casualty accidents produced a lower proportion of fatalities and less severe injuries than did non-intersection casualty accidents.

In terms of countermeasures, high-visibility police enforcement campaigns at controlled intersections has shown promise as a way to reduce, at least for the duration of the campaign, driving behaviours that could lead to traffic accidents (Mercer, 1986). However, as two-thirds of intersection accidents occurred at intersections with no traffic signs or signals, or at intersections with only stop signs, and as these sorts of intersections are far too numerous to be included in targetted intersection enforcement campaigns, it follows that driver education dealing with right-of-way and driver courtesy may help to reduce these accidents. Further, as a high proportion of intersection casualty accidents involve rear-end collisions, driver education on following distances might be considered.

The target groups for such education materials ought to focus on adult drivers carrying no passengers who are on the road during "rush hours", and on adult female drivers carrying young passengers. Themes that could prove useful might include the notion of not carrying the day's work stress over into the task of driving home, of responsibility to those waiting at home, and, especially for the female driver, responsibility for her young passengers.

Finally, unlike the speed-and-alcohol traffic accidents that tend not to occur at intersections, intersection casualty accidents appear to be less of a product of "lifestyle" and more of a product of inattention, discourtesy, and perhaps ignorance of the basic rules of the road. Consequently, with a combination of public education and police enforcement programs, there is reason to hope that these accidents could be successfully reduced.

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